

REMARKS

Claims 10 and 13 are being amended so that the reactants used in making the aliphatic urethane (meth)acrylate used in the lacquer coating must include : a polyisocyanate based on acyclic aliphatic diisocyanate having 8 carbon atoms; or a polyol, or a combination of a polyol and polyisocyanate based on an acyclic aliphatic diisocyanate having 8 carbon atoms.

Claims 11 and 14 are being amended to delete subject matter that is now redundant in view of the amendments to claims 10 and 13. Claims 17 and 18 are being amended to depend from claims 10 and 13, since the amendments to claims 10 and 13 now provide proper antecedent basis for claims 17 and 18.

Claims 10 and 13, as presently amended, recite a process for coating a clear lacquer coating over a base lacquer in a base lacquer/clear lacquer two-coat lacquering system, comprising applying a base lacquer coating; applying the clear lacquer coating onto the base lacquer coating as a top coating; and curing the clear lacquer coating with high-energy radiation. The clear lacquer coating contains a resin containing a radically polymerizable oligomer or polymer having at least one olefinically unsaturated group; 75 to 100 wt% of the resin is an aliphatic urethane (meth)acrylate having an average (meth)acryloyl functionality of 3 to 4.5 and a calculated molecular mass of at least 826. The amended claims now expressly require that the aliphatic urethane (meth)acrylate is formed by reacting an isocyanate compound selected from the group consisting of acyclic aliphatic diisocyanates having 8 C atoms, polyisocyanates based on an acyclic aliphatic diisocyanate having 8 C atoms, and combinations thereof, with at least one low-molecular aliphatic compound having at least one hydroxy group and at least one (meth)acryloyl group, and optionally with at least one low-molecular aliphatic hydroxy reactant selected from the group consisting of diols and polyols. Claims 10 and 13 further require that at least one polyisocyanate, or at least one polyol, or at least one polyisocyanate and at least one polyol, are reacted in said forming of the aliphatic urethane (meth)acrylate. Thus, the reactants used in making the aliphatic urethane (meth)acrylate must include: a polyisocyanate based on acyclic aliphatic diisocyanate having 8 carbon atoms; or a polyol; or a combination of a polyol and polyisocyanate based on an acyclic aliphatic diisocyanate having 8 carbon atoms.

The amendments to claims 10 and 13 introduce no new matter and are supported in the specification as filed, *inter alia*, from page 4, line 20 through page 5, line 6.

Rejections under 35 U.S.C. §103(a)

Betz in view of Bishop

Claims 10, 12, 13, 15 and 19-24 were again rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,261,645 to Betz in view of U.S. Patent No. 4,609,718 to Bishop (which corresponds to EP 204161).

Betz discloses coating compositions containing one or more radiation curable binders and/or one or more reactive diluents, optionally with one or more photoinitiators. Betz discloses, as examples of binders, urethane acrylates. As the Examiner has noted, Betz discloses that urethane meth(acrylates) can be made by reacting some of the isocyanate groups of a diisocyanate or polyisocyanate with a hydroxyalkyl ester and then reacting the remaining isocyanate groups with a chain extender, and cites the European counterpart of Bishop for such methods. However, neither Betz, nor the disclosures of Bishop relied upon by Betz and cited by the Examiner, disclose or suggest any aliphatic urethane (meth)acrylate having an average (meth)acryloyl functionality of 3 to 4.5 and a calculated molecular mass of at least 826, or any process parameters for forming any aliphatic urethane (meth)acrylate having the recited characteristics.

Bishop does not disclose, teach, or suggest an aliphatic urethane (meth)acrylate made from a polyisocyanate based on acyclic aliphatic diisocyanate having 8 carbon atoms, or a polyol, or a combination of a polyol and polyisocyanate based on an acyclic aliphatic diisocyanate having 8 carbon atoms, as required by the present claims. Bishop discloses only a linear acrylate-terminated polyurethane oligomer, which is, by definition, difunctional. In contrast, as recited in the present claims, the present invention provides lacquers that contain an aliphatic urethane (meth)acrylate having a functionality of 3 to 4.5. The claims now recite components for making the aliphatic urethane (meth)acrylate that ensure such a functionality. Applicants further submit that, as stated in the specification on page 3, lines 23-26, it is essential to the present invention that the aliphatic urethane (meth)acrylate have

a functionality of 3 to 4.5 per molecule. Bishop is therefore lacking in an essential feature of the presently claimed invention. Although, as the Examiner has pointed out, Bishop states broadly and without support that "any organic diisocyanate can be used to form the acrylate-terminated oligomers", Applicants submit that the exemplary diisocyanates listed by Bishop would not provide the functionality required by the present claims, and that there is no motivation provided by Bishop to use only components that would provide a functionality of 3 to 4.5, in order to obtain transparent finishing coats having the desirable properties of the coatings of the present invention, namely flexibility and scratch resistance. Applicants further submit that undue experimentation by one of ordinary skill in the art would be required in order to determine whether in fact "any" diisocyanate would work in the process disclosed by Bishop or provide the coatings of the present invention.

Regarding claims 20- 24, Applicants submit that since the claimed coating processes are not obvious over Betz in view of Bishop, the dependent claims reciting particular embodiments of the processes or substrates coated by the processes, are also not rendered obvious by Betz in view of Bishop.

Accordingly, Applicants submit that Betz, in combination with Bishop, does not disclose, teach, or suggest the presently claimed invention.

Betz in view of Bishop, further in view of Heil

Claims 11, 14, and 16-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Betz in view of Bishop, further in view of Heil.

The Examiner has relied on Heil for the disclosure that diisocyanates or polyisocyanates derived by biuretization of hexamethylene diisocyanate or by trimerization of hexamethylene diisocyanate to isocyanurate are suitable for preparing polyurethane acrylate polymers. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to have used such diisocyanates or polyisocyanates as the polyisocyanates of Betz in view of Bishop for preparing polyurethane acrylate polymers. Applicants respectfully disagree not only with the Examiner's assertion that the teachings of Heil, when combined with those of Betz in view of Bishop, render Applicants' claims obvious, but also with the Examiner's apparent belief that one of ordinary skill in the art would find any motivation in Heil, Betz or Bishop to combine the teachings of Heil with those of Betz and/or Bishop.

Applicants fail to see any motivation for a person of ordinary skill in the art, reading the art related to lacquer coatings made from diisocyanates or polyisocyanates to look to Heil. Heil is directed to magnetic recording media. The polymers to which Heil is directed are intended as matrices for magnetic layers, and a person of ordinary skill in the art would not expect such polymers to have properties that make them advantageous as lacquer coatings. Therefore, Applicants submit that there would be no motivation for a person of ordinary skill in the art to combine the disclosures of Heil with those of Betz and/or Bishop.

Accordingly, Applicants respectfully submit that claims 11, 14 and 16-18 are patentable over Betz, Bishop and Heil, alone or in any combination.

Summary

In view of the foregoing remarks, Applicants submit that all of the pending claims are in condition for allowance. In order to expedite disposition of this case, the Examiner is invited to contact Applicants' representative at the telephone number below to resolve any remaining issues.

Applicants believe that there are no fees due but should there be any fee due which is unaccounted for, please charge such fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Respectfully submitted,

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